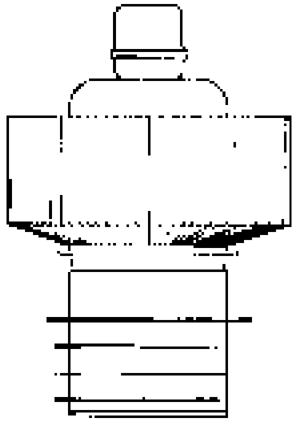


4CX1500A
Radial Beam Tetrode

The Penta 4CX1500A is a general purpose tetrode for use up to and through VHF. Insulation is ceramic and the thoriated tungsten filament is a rugged mesh design. The screen terminal is a continuos ring which allows good isolation between the plate circuit and the control grid circuit.

The 4CX1500A is recommended for use as a class C power amplifier, class B, or class AB1 linear amplifier, as a regulator, and in pulse modulation service.

Electrical Characteristics

Filament Voltage	5.0	Volts
Filament Current	38.5	Amps
Amplification Factor (Grid to Screen)	5.5	
Transconductance (Ib = 1 Ampere, Eb = 2000 Volts, Ec2 = 500 Volts)	26,000	µmho
Frequency for Maximum Ratings	150	MHz
Direct Interelectrode Capacitances (Grounded Cathode)		
Cin	78.0	pf
Cout	10.5	pf
Cgp	0.25	pf

Mechanical Characteristics

Base	Special ring and breechblock terminal surfaces
Recommended Socket	SK-831
Recommended Air Chimney	SK-806
Operating Position	Vertical, anode up or down
Maximum Temperature	250 °C
Cooling	Forced Air

Revised 12/27/99

P E N T A L A B O R A T O R I E S
9740 COZYCROFT AVENUE * CHATSWORTH * CALIFORNIA 91311
(800) 421-4219 * (818) 882-3872 * FAX: (818) 882-3968

ELECTRON TUBES FOR INDUSTRY

Maximum Dimensions

Height	4.90 inch (124.5 mm)
Diameter	3.37 inch (85.6 mm)
Net Weight	30 oz. (850 gm)

Radio Frequency Linear Amplifier Class AB

Maximum Ratings

DC Plate Voltage	4000	Volts
DC Screen Voltage	750	Volts
DC Plate Current	1.0	Ampere
Plate Dissipation	1500	Watts
Screen Dissipation	75	Watts
Control Grid Dissipation	25	Watts

Typical Operation

DC Plate Voltage	2500	3900	Volts
DC Screen Voltage	600	600	Volts
DC Grid Voltage (approx)	-105	-110	Volts
Zero Signal Plate Current	250	200	mA
Maximum Signal Plate Current	765	750	mA
Maximim Signal Screen Current (approx)	46	40	mA
Peak RF Driving Voltage	95	100	Volts
Resonant Plate Load Resistance	1670	2900	Ω
Maximim Signal Plate Power Output	1080	1850	Watts

Radio Frequency Power Amplifier or Oscillator

Class C Telegraphy or FM (Continuous Operating Conditions)

Maximum Ratings

DC Plate Voltage	5000	Volts
DC Screen Voltage	750	Volts
DC Plate Current	1.0	Ampere
Plate Dissipation	1500	Watts
Screen Dissipation	75	Watts
Control Grid Dissipation	25	Watts

Typical Operation

DC Plate Voltage	3000	4000	Votls
DC Screen Voltage	500	500	Volts
DC Grid Voltage (approx)	-200	-200	Volts
DC Plate Current	800	800	mA
DC Screen Current	36	37	mA
DC Grid Current	17	15	mA
Peak RF Grid Voltage	240	240	Volts
Driving Power	4.1	3.6	Watts
Resonant Load Resistance	1720	2570	Ω
Plate Dissipation	600	700	Watts
Power Output	1800	2500	Watts

Plate Modulated Radio Frequency Power Amplifier

Class C Telephony (Carrier Conditions unless noted)

Maximum Ratings

DC Plate Voltage	3500	Volts
DC Screen Voltage	550	Volts
DC Plate Current	0.8	Ampere
Plate Dissipation	1000	Watts
Screen Dissipation	75	Watts
Control Grid Dissipation	25	Watts

Typical Operation

DC Plate Voltage	2500	3400	Volts
DC Screen Voltage	500	500	Volts
DC Grid Voltage (approx)	-300	-300	Volts
Peak Audio Screen Voltage (for 100% mod. approx.)	500	500	Volts
DC Plate Current	800	900	mA
Maximum Signal Plate Current	765	750	mA
DC Screen Current (approx)	46	28	mA
DC Grid Current (approx)	27	28	mA
Peak RF Grid Voltage	365	365	Volts
Grid Driving Power	10	10	Watts
Resonant Load Resistance	3200	1940	Ω
Plate Dissipation	620	780	Watts
Plate Power Output	1600	2320	Watts

Audio Frequency Power Amplifier or Modulator

Class AB

Maximum Ratings

DC Plate Voltage	4000	Volts
DC Screen Voltage	750	Volts
DC Plate Current	1.0	Ampere
Plate Dissipation	1500	Watts
Screen Dissipation	75	Watts
Control Grid Dissipation	25	Watts

Typical Operation (Two Tubes) Class AB1

DC Plate Voltage	2500	3900	Votls
DC Screen Voltage	600	600	Volts
DC Grid Voltage (approx)	-105	-110	Volts
Zero Signal Plate Current	500	400	mA
Maximum Signal Plate Current	1.53	1.50	A
Maximim Signal Screen Current (approx)	90	80	mA
Peak AF Driving Voltage	95	100	Volts
Load Resistance, Plate to Plate	3340	5800	Ω
Maximum Signal Plate Dissipation (per tube)	820	1070	Watts
Maximim Signal Plate Power Output	2160	3700	Watts

Cooling

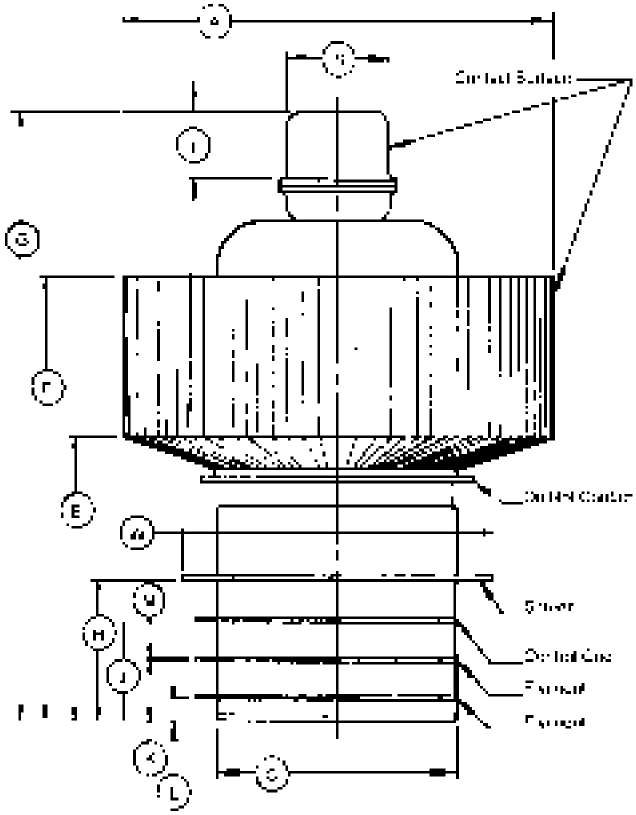
The maximum temperature rating for the anode core of the 4CX1500A is 250°C. Sufficient forced air circulation must be provided to keep the of the anode at the base of the cooling fins and the temperature of the ceramic/metal seals below 250°C. Air flow requirments to maintain seal temperature at 225°C in 50°C ambient air are tabulated below (for operation below 30 MHz).

	Sea Level		6000 Feet	
Plate Dissipation (Watts)	Air Flow (CFM)	Pressure Drop (Inches of water)	Air Flow (CFM)	Pressure Drop (Inches of water)
1000	27	0.33	33	0.40
1500	47	0.76	58	0.95

The blower selected in a given application must be capable of supplying the desired air flow at a back pressure equal to the pressure drop shown above plus any drop encountered in ducts and filters.

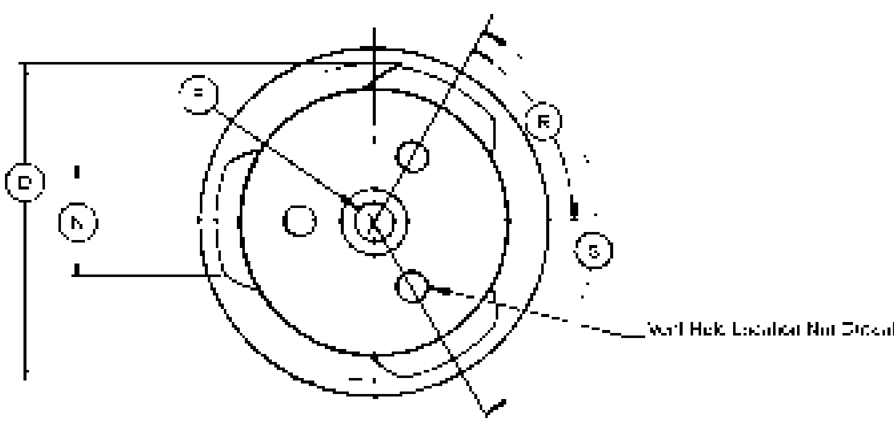
At other altitudes and ambient air temperatures the flow rate must be modified to obtain equivelent cooling. The flow rate and corresponding pressure differential must be determined individually in such cases, using rated maximum temperatures as the criteria for satisfactory cooling.

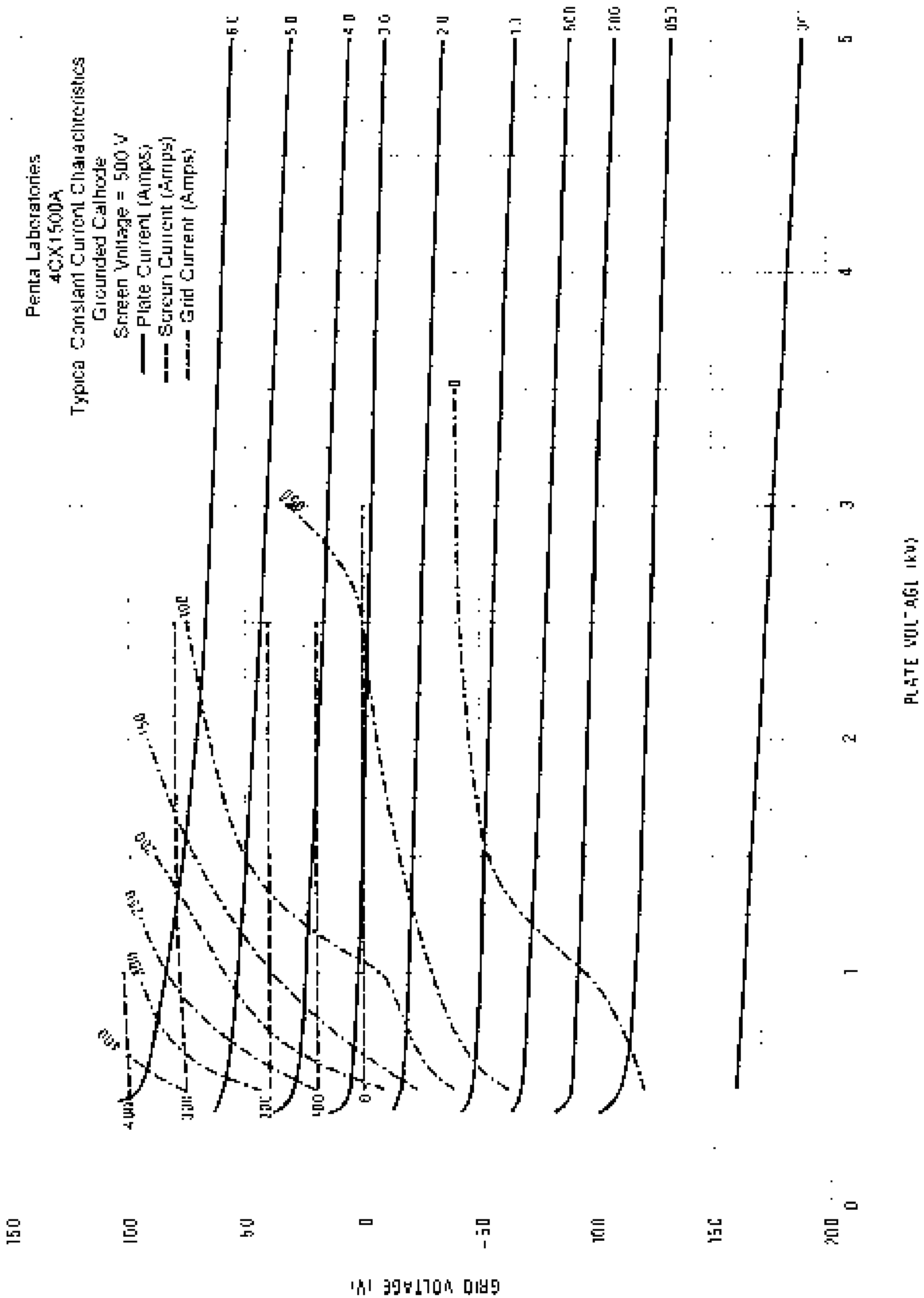
4CX1500A Radial Beam Tetrode

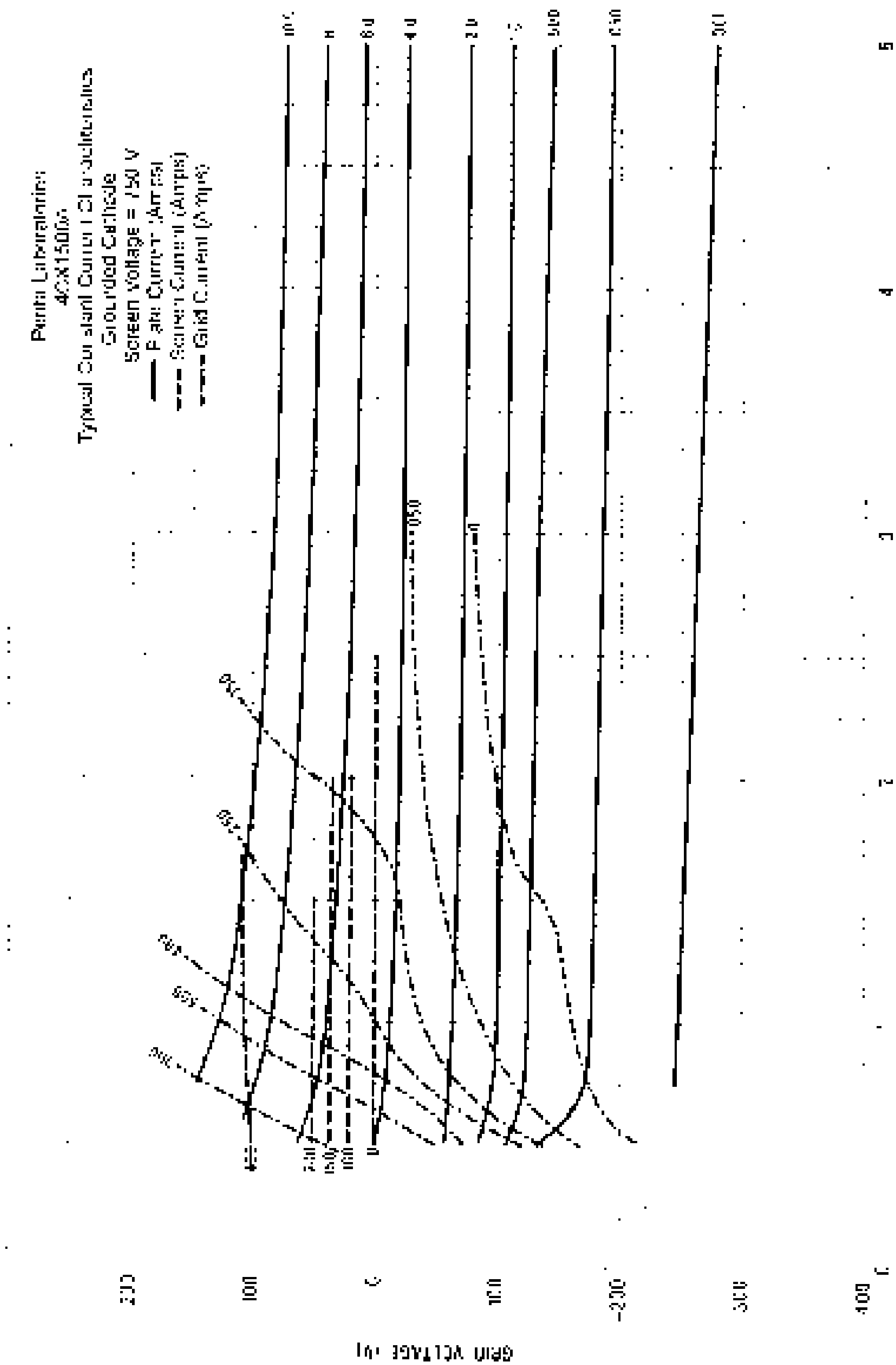


Dimensional Data

Dim.	Inches Min.	Inches Max.	Millimeters Min.	Millimeters Max.
A	3.335	3.370	84.71	85.60
B	0.807	0.820	20.50	20.83
C	1.865	1.900	47.37	48.26
D	2.250	2.300	57.15	58.42
E	2.265	2.465	57.53	62.61
F	3.454	3.654	87.73	92.81
G	4.675	4.900	118.74	124.46
H	0.965	0.988	24.51	25.09
J	0.690	0.710	17.53	18.03
K	0.415	0.435	10.54	11.05
L	0.140	0.165	3.56	4.19
M	0.018	0.030	0.46	0.76
N	0.700	0.800	17.78	20.32
P	0.314	0.326	7.97	8.28
R	55°	65°	55°	65°
S	115°	125°	115°	125°
T	0.470	0.530	11.94	13.46
W	2.468	2.531	62.69	64.29




Penta Laboratories
4CX1500A
Typical Constant Current Characteristics
Grounded Cathode
Screen Voltage = 500 V
Plate Current (Amps)
Screen Current (Amps)
Grid Current (Amps)
PLATE VOLTAGE (kV)
GRID VOLTAGE (V)


Penta Laboratories
4CX1500A
Grounded Cathode
Screen Voltage = 750 V
Plate Current (Amps)
Screen Current (Amps)
Grid Current (Amps)
PLATE VOLTAGE (KV)
GRID VOLTAGE (V)